OTHER GEARED UNITS

Minimum Equipment Performance Standards and Preventive Maintenance Required Under This Contract

Geared Passenger Elevators

Frequency of Inspections: Semi-monthly

Each inspection to be signed for by the Owners Representative.

1. Call-back Standards: Nominally expected four (4) per year to eight (8) excluding nuisance calls.

2. Minimum expected periodic servicing, checking and adjustments.

   a). Every two (2) weeks: ride the car, observe operation of control, machine, brake and motor. Clean and adjust as needed, check lubrication of machine and motor.

   b). Every thirteen (13) weeks: Test and record rectifier-voltages of control supply, normal landing switches and door operator.

   c). Every twenty-six (26) weeks: Check governor and governor tail sheave lubrication, all cables, adjust and lubricate as required. Clean and examine Saf-T-Edge, guide shoes, lubricate and adjust as needed.

   d). Every fifty-two (52) weeks: Clean oil and adjust all door hangers, check all control switches in hatch, including care and corridor stations. Thoroughly check all control parts in machine room, brake, machine, check gear clearance. Make sure all electrical connections are tight.

   e). Other: machine bearings should be drained, flushed and refilled every two (2) years and the door operator every four (4) years.

3. Doors and Door Operation: Frequency of inspections and adjustment briefly covered above.

   a). Car and Hoistway Doors: Clean and lubricate track and hangers as needed. Check backplate and hanger to door fastenings, relating devices to insure tightness. Check up-thrust adjustment and fastening (nominal 0.010” to track), should clearance exceed 0.035” it should be adjusted. Check tightness of relating devices. Door interlock adjustment to be set to permit the latch to drop within 3/8” or less of full closure. Check contact setting for pressure and contact wipe. Bottom door guides should be fastened tight and replaced when panel may be move in and out by ¼” or more. Check and tighten non-vision wings/sight guards at each inspection. Final latch cam and spring adjustment to be set to fully close the doors to locking position when within 1” to 1 ½” of full

closure. Car door contact should be set to prevent car movement unless door is 2" or less from full closure.

b). Saf-T-Edge: Device should be checked semi-annual for freedom of movement to permit it to operate with even a somewhat glancing blow, but not sloppy permitting it to rub against door. Where retractable projection is used at the opening it should be slight but permit the door to be held open with a slight pressure on the edge, in closing, edge should permit door to reopen within 1-1/2" of full closure or less. Reopening action should be such that reversal of the door movement will occur at such a point or before the leading edge of the vane and door are in the same plane. i.e. at or before the complete collapse of the edge. Active contact line of the edge should be free of cuts or bulges. Control contact cable, and retracting cable, where used should be held clear of snagging on other moving parts.

c). Door Operator: Check, lubricate, and adjust quarterly, where gear operators are used, gear oil level should be checked and the unit cleaned and flushed and refilled within five (5) years. Opening motions should be at design speed smooth start, slowdown and stop, with particular care being taken to avoid drag in the opening action as the door reaches full open position. Closing time should be adjusted to comply with the current requirements on kinetic energy and smooth start and stop. Closing adjustment should permit door reversal within travel of the Saf-T-Edge as above without further drift.

4. Control:

a). Regular inspections and adjustments as outlined above. The effects of control fault can be most easily detected for individual car operation by riding the unit and observing operation. At each scheduled control inspection the operation of the relays in the panel in normal service can suggest trouble areas, erratic relay operation or contact sparking. Touch up adjustment suggested by these observations can frequently avoid drift off of adjustment and a major tune up, or failure of a more serious nature. Mechanical check of relay operation can best be done with the power off, testing contact pressure and wipe, as well as friction where relays appear sluggish. At first power cut off check frequent operating relays for overheating by touch. This should be done particularly for relay in the circuit where undue sparking is apparent. At the same time transformers and rectifiers should be checked for heat. The rectifier voltage should be periodically checked and compared to posted values, confirming periodic check and recording variation, if any. Contacts should be found to be clean if contact wipe is sufficient, they should only be dressed if they have developed ridges, blisters, or are excessively pitted. Should the condition be beyond correction they should be replaced. On occasion pins or relay fulcrum points may give rough or sluggish relay action and may need slight lubrication or dressing. Proper values of timing relays should be posted on the control cabinet or panel and checked at control inspection schedule. Particular attention should be paid to all overload and phase failure relays where they are used checking adjustment and freedom of movement. A log of corrections and adjustment of each controller, studied at each scheduled inspection can be a time saver in clearing troubles and preventative maintenance adjustment.

5. Machine Bearings and Motors:

a). Machine Bearings: Should be checked every three (3) weeks for oil leakage, throwing away oil which has dripped from worm gland (some oil) seepage at the gland prevents galling worm shaft). Check worm and gear clearance at the time the brake is dismantled by turning the brake drum to see how far it may move before the drive sheave moves. On machines which can be reset, gear should be lowered when this movement exceeds ¼", when the movement exceeds this value, gear or worm may have to be re-operated which should be done on those machines where the movement is ½" to 1", i.e. when clearance between worm and gear (nominally 0.005") exceeds 0.075" gear rock is virtually impossible to take out by reoperation and can only get worse. Also note when clearance can no longer be taken up as we can no longer lower the gear, gear rock and replacement is inevitable. (Worms and gears are not shelf items and require three (3) to six (6) months lead time). Clean, flush and replace worm gear oil every 1- ½ years, examine oil wiper between drive sheave and gear inside the machine to reduce oil seepage to drive sheave. Drive sheaves may be re-grooved but never if the re-grooving will approach the depth of leaking less than ½" of solid metal below the groove.

b). Machine Brake: Should be thoroughly cleaned, lubricated and checked from freedom of operation, at least once a year. Since this required dismantling for a thorough inspection and lubrication, counterweights should be landed. The brake should be set to handle 125% of full load and was so set at initial adjustment. To retain this setting, compressed length of the brake springs should be measured before dismantling and restored in reassembly. This length should be checked periodically and spring/springs readjusted as the shoes are brought closed to the brake pulley to compensate for brake lining wear. Lining should be replaced before the wear reaches a point where the drum could be scored. Check operating armature and its guide for excessive wear to avoid erratic brake operation.

c). Motor MG Sets: Check bearings for heating and lubrication every two (2) weeks. Care should be exercised in brush wear and the type brushes used. Blow the units out yearly, check insulation, and repaint with insulating varnish every three (3) years. Dry and brittle insulation can result in a burn out and fire. It must be remembered that coils in stock can get brittle and their insulation should be examined and restored as needed. It must be remembered that a fire originating in the apparatus is your responsibility.

6. Hoistway Equipment:

a). Hoistway switches: Should be checked for contact pressure, wear and wipe quarterly where involved in the landing of the elevator, annually for all safety equipment, slowdown and limits.

b). Safety Equipment: Should be checked for freedom of movement yearly and lubricated as required, with governor and tension sheave lubricated each quarter, oil buffers should be

checked for oil level yearly. Note: Should water level in pit rise above buffer reservoir, buffers should be drained, flushed and refilled.

c). Overhead and Deflector Sheaves: Check lubrication and grooves annually, same stipulation to re-grooving as groove depth for drive sheaves.

d). Guide Rails and Roller Guides: Should be cleaned and checked annually, roller guides adjusted to rail where this is applicable. Check guide oilers and fill as required where they are used. Should a safety have set for any reason, rails should be examined carefully for possible scoring.

e). Car and Corridor Stations: Should be opened each year for cleaning and the switches each examined for positive action checked to see that they are tight.

f). Cables: Should be examined every thirteen (13) weeks. Control cables or traveling conductors for cover deterioration which may be affected or major portions of the cover are brittle. When re-taping care should be taken to secure the ends so that they do not hang on hoistway equipment. Guards may be required to cover points which may cause traveling cable abrasion. Governor and hoist cables should be examined for breaks, particularly in the valley of the cable which could indicate internal breakage and ultimate strand separation. Hoist cables may need cleaning and on occasion added lubricant (rope dressing). Governor cables should never be lubricated. They should remain dry in order to assure consistent setting should the governor trip.